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School burnout and sleep in Finnish secondary school students

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ABSTRACT

Introduction: Studies have shown that poor sleep is related to burnout, but research to date has not yet explored sleep-related factors in relation to school burnout. **Methods:** A total of 555 students, aged 15 to 20 years, participated in this study. The participants reported their diurnal patterns, sleep quality, tiredness, and school burnout in printed questionnaires. Using logistic regression analysis, the study examined how sleep-related factors explained school burnout. **Results:** School burnout was related to daytime sleepiness, tiredness and poor sleep quality. Neither time in bed, social jet lag nor diurnal preferences could explain school burnout. **Conclusion:** The results contribute to the growing evidence showing the importance of sleep for well-being.

Keywords: Students; Burnout, Professional; Sleep; Sleep Disorder; Education, Secondary.

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INTRODUCTION

A large body of evidence suggests that poor sleep and stress experienced by adults are related^{1,2}. For instance, employees suffering from work-related stress or burnout often complain of an inadequate amount of sleep or unsatisfactory sleep quality^{3,4}. In addition, adults showing a high level of burnout also seem to prefer a late bedtime and wake-up time⁵. Though the causal relationship between poor sleep and burnout is still to be investigated in detail, some evidence supports the conclusion that poor sleep precedes burnout, rather than vice versa^{6,7}.

Compared to research on occupational burnout and sleep, there is a paucity of research concerning the relation between sleep and burnout in adolescents and young adults still in formal education (i.e. school burnout). Recently, inadequate amount of sleep and daytime sleepiness have been reported to be correlated with higher levels of burnout among medical students⁸. Daytime sleepiness in particular seems to have a major role in medical student burnout⁹. A previous study¹⁰ has presented evidence suggesting that school burnout is linked to sleep disturbances and poor sleep quality in vocational school students.

Research on burnout has long dealt with chronic stress experienced by adult employees¹¹. Relatively recently, the concept of burnout has developed from this research tradition to concern youths and young adults in formal education¹²⁻¹⁴. Accordingly, school burnout refers to persistent school-related stress in students. Similarly to adult occupational burnout¹⁵ it includes three separate but relatively closely correlating aspects: exhaustion, cynicism, and lack of school-related efficacy (inadequacy) — or depersonalization in other terms¹²⁻¹⁴. Exhaustion consists of school-related feelings of stress and particularly chronic sleep-unrelated fatigue due to school demands whereas cynicism is indicated by a lack of interest in schoolwork and a sense of the meaninglessness of studying. Lack of efficacy can be described as a state of feeling incompetent, as well as decreased school achievement. Cynicism and particularly emotional exhaustion predict later upcoming feelings of inadequacy¹⁶.

The prevalence of school burnout in addition to several aspects of it are known by now. More girls and women than boys and men as well as more students in upper secondary high school than students in vocational school suffer from school burnout. In addition, school burnout seems to be more common in upper secondary high school for both girls and boys¹⁷. In Finland, according to the National Institute for Health and Welfare's national survey in 2015 9% of male and 18% of female students in upper secondary high school and 6% of male and 11% of female students in vocational school reported feelings of burnout¹⁸. Hence, school burnout appears to be rather common among Finnish students. The most prominent factors leading directly or indirectly to school burnout are insufficient study resources, poor personal resources (e.g., low self-efficacy) and high study demands¹⁹.

School burnout is negatively linked to several indicators of well-being and school achievement^{13,20}. Of the three

components of burnout, cynicism towards school often co-occurring with poor school achievement appears to predict school drop-out²¹. Moreover, a high level of school burnout during secondary education seems to predict low life satisfaction²², low schoolwork engagement^{19,23}, and poor academic success after secondary education²³.

In conclusion, school burnout has been associated in several ways with well-being and academic performance. However, its relation to sleep has remained relatively unknown. The present study has aimed to fill this gap. The objective of the present study was to explore how time in bed, sleep quality, daytime tiredness, and diurnal preferences of sleep are related to school burnout and its different aspects in 15–20-year-old students. One previous study²² showed that social jetlag (i.e. compared to school week, delayed circadian pattern during weekends) can be a risk for health in young adults. Therefore, we were also interested in finding out, whether social jet lag is associated with school burnout. A detailed analysis of sleep measures concerning the data in the present study has been published elsewhere²⁴. Based on previous work, we hypothesized that a high level of school burnout is related to shorter time in bed and daytime tiredness⁸, poor sleep quality¹⁰, and a preference for late bedtime and wake-up time (evening-type chronotype, see, e.g.,^{25,26}). Because school burnout is more common in upper secondary high schools than in vocational schools¹⁷, we picked up the form of schooling as one of the factors explaining school burnout.

METHODS

Participants and procedure

The study design was approved by an ethical board at the University of Helsinki. Permission to carry out the study was received from local school authorities. The participants were recruited from different upper secondary high schools (49% of the sample) and vocational schools (51% of the sample). In Finland, after 9-year compulsory comprehensive school, nearly the whole cohort enters upper secondary high school or vocational school. Only a small minority discontinue their education. Data were collected in three major metropolitan cities (together comprising about 1 million inhabitants) and two small towns (54 000 and 21 000 inhabitants) in southern Finland.

Using paper and pencil, the participants anonymously filled in several scales exploring sleep and well-being (incl. school burnout) in a 25-minute session. The participants could discontinue the process at any time if they so wished. About 580 participants produced eligible answers, but participants older than 20 were dismissed from the data. Thus, 555 students (247 females, 44.5%, one missing gender value) aged 15–20 years were left in the data. The mean age on the respondents was 16.83 years ($SD=0.90$). The participants in vocational schools were slightly younger ($M=16.75$, $SD=0.96$) than those in upper secondary high schools ($M=16.92$, $SD=0.83$), $U=31758.5$, $p<.001$. Missing values, which were relatively infrequent and random, decreased the number of informants in some scales.

Measures

School burnout was investigated using the nine-item version of the School Burnout Inventory (SBI, 13). It has three subscales. *Exhaustion with schoolwork* (hereafter *Exhaustion*) is assessed using four items (e.g., “I feel overwhelmed by my schoolwork”). The subscale *Cynicism toward the meaning of school* (hereafter *Cynicism*) comprises three items (e.g., “I feel that I am losing interest in my schoolwork”), whereas *Sense of inadequacy at school* (hereafter *Inadequacy*) includes two statements (e.g., “I often have feelings of inadequacy in my schoolwork”). All items were rated on a 6-point Likert scale ranging from 1 (completely disagree) to 6 (strongly agree).

To analyze sleep factors explaining school burnout, participants in the three lower quartiles and those in the highest quartile of the burnout measures, i.e. school burnout, exhaustion, cynicism and inadequacy, were compared.

Time in bed and mid-sleep were investigated using two questions: “When did you go to sleep yesterday?” and “When did you wake up today?” Data were collected on one day between Monday and Thursday during a normal five-day school week. The time in bed was calculated using these data. In assessing the time in bed during weekend two questions were asked: “When do you usually go to bed on Friday and Saturday nights?” and “When do you usually wake up on Saturday and Sunday mornings?” Mid-sleep during the weekends was examined using these questions²⁶.

Social jetlag was measured by calculating the difference between mid-sleep on schooldays and mid-sleep on weekends²⁷.

The *Epworth Sleepiness Scale* (ESS) and *daytime tiredness*. The ESS²⁸ is an eight-item measure of daytime sleepiness. Participants are asked to evaluate how likely it is that they would doze or fall asleep in everyday situations (e.g., “Sitting and reading” and “As a passenger in a car for an hour without a break”). Each item is answered using the following options: 0 = would never doze, 1 = slight chance of dozing, 2 = moderate chance of dozing, and 3 = high chance of dozing. Daytime tiredness was estimated using two questions (1 = very alert – 5 = very tired) concerning how tired the participant was in the morning and during the day on weekdays.

Poor sleep quality was assessed using the following four items of the Athens Insomnia Scale²⁹: sleep induction, awakenings during the night, final awakening earlier than desired, and overall quality of sleep. Each item was scored from zero (no problems) to three (very problematic).

Chronotypes. Individuals can be categorized into different types according to their preferred timing of sleep³⁰. Morningtypes (M-types) prefer early bedtime and early wake-up, whereas Eveningtypes (E-types) show lateness in getting to bed and postponed wake-up. The Intermediate type (I-type), between these, is often considered to be the most frequent chronotype. A shortened version³¹ of the Morningness-Eveningness Questionnaire³² was used to assess the chronotypes of the participants. This version includes six items, yielding 5–27 points. Participants obtaining 19–27 points were classified as M-types, those with 13–18 points I-types, and those with 5–12 points E-types³³.

Statistical analysis

Because many of the variables were not normally distributed, only nonparametric statistical analyses (Spearman correlations and logistic regression analyses) were adopted. Statistical analyses were carried out using the SPSS 24 statistical software package. Logistic regression analysis was applied to explore the sleep variables explaining the total score of school burnout.

RESULTS

Descriptive data concerning the main measures are given in Table 1. The internal consistency of the instruments used was satisfactory. Only 47 (8.9%) of the participants were classified as M-types. The Intermediate type was the most common (289 students, 54.5%) followed by E-types (193 students, 36.6%).

Table 1. Descriptive data concerning main measures.

	α	M	SD
School burnout, total ^a	.90	2.57	1.05
Exhaustion ^a	.82	2.62	1.17
Cynicism ^a	.87	2.36	1.25
Inadequacy ^a	.72	2.77	1.25
Time in bed, h:min	–	7:43	1:22
Social jetlag, h:min		1:27	1:20
Daytime sleepiness, ESS ^b	.79	6.79	4.26
Daytime tiredness ^c	.67	6.47	1.58
Poor sleep quality ^d	.69	1.84	1.89
Chronotype, morningness ^e	.67	13.81	3.68

Note. α = Cronbach's alpha. n = 530–553. ESS = Epworth Sleepiness Scale.

^a = scale 1–6, ^b = scale 0–24, ^c = scale 2–10, ^d = scale 0–3, ^e = scale 5–27.

Table 2 gives Spearman correlations for school burnout and sleep-related measures. Except for time in bed during the school week, all other sleep measures correlated statistically significantly with total school burnout and its subscales. How a participant subjectively experienced tiredness (daytime tiredness) and how likely she or he was to doze off in everyday situations as well as poor sleep quality were positively linked to the level of all school burnout measures. The correlational pattern also suggests that, on a morningness–eveningness continuum, individuals with a morning orientation reported less school burnout compared to those with a stronger evening orientation.

Finally, we conducted a stepwise logistic regression analysis to determine which sleep variables (daytime tiredness, daytime sleepiness and sleep quality) and education forms (vocational school vs upper secondary high school) are related to school burnout (Table 3). Time in bed, social jetlag and chronotype were not included in the model because they were not able to explain school burnout statistically significantly. Four variables were independently associated with burnout. School burnout was more common in upper secondary high school (OR, 4.80; $p=.00$) compared to vocational school students. School burnout was also related to daytime sleepiness (OR, 1.13; $p=.00$), daytime tiredness (OR 1.51; $p=.00$) and poor sleep quality (OR, 1.33; $p=.00$).

Table 2. Spearman correlations between school burnout and sleep-related variables.

	School burnout, total	Exhaustion	Cynicism	Inadequacy
Time in bed during school week	.02	.06	-.04	.01
Social jetlag	.10**	.08	.05	.11**
Daytime sleepiness, ESS	.27***	.21***	.25***	.25***
Daytime tiredness	.39***	.30***	.39***	.31***
Poor sleep quality	.32***	.32***	.21***	.27***
Chronotype, morningness	-.23***	-.14**	-.28***	-.19***

Note. ** $p < .01$, *** $p < .001$, $n = 529$ – 553 , ESS = Epworth Sleepiness Scale

Table 3. Logistic regression analysis predicting high school burnout.

Measure	B	Wald χ^2 -test	p	Odds Ratio	95% Confidence Interval for Odds Ratio	
					Lower	Upper
School type	1.57	36.37	.000	4.80	2.88	7.99
Daytime sleepiness (ESS)	.12	17.76	.000	1.13	1.07	1.20
Daytime tiredness	.41	23.50	.000	1.51	1.28	1.78
Poor sleep quality	.29	20.65	.000	1.33	1.18	1.51

Note. School type: 1 = vocational school, 2 = upper secondary high school. $\chi^2(4) = 132.05$, $p < .001$. The overall percentage for correct predictions was 81.0%. The goodness-of-fit indices were tolerable. Nagelkerke's pseudo R^2 was .34.

We separately analyzed the predictive values of sleep measures on the different subscales of school burnout. Compared to the aforementioned analysis, sleep-related measures explained Exhaustion, Cynicism, and Inadequacy in a similar way, with minor exceptions.

DISCUSSION

This investigation aimed at exploring the relation between sleep and school burnout in a relatively large sample of Finnish 15–20-year-old students. The results are consistent with previous research¹⁷ suggesting that attending upper secondary high school explains school burnout rather than attending vocational school. The findings partially confirmed the study's hypothesis, showing that of the sleep-related factors, daytime tiredness, daytime sleepiness and poor sleep quality may be associated with school burnout. These results reflect those of Wolf and Rosenstock⁸ and Pagnin et al.⁹, who also found that among medical students daytime sleepiness is correlated with higher levels of burnout. The results of this study were also consistent with those of Gerber et al.¹⁰ who suggest that school burnout is linked to sleep disturbances and poor sleep quality. According to present study, social jet lag is only weakly correlated with school burnout.

Wolf and Rosenstock showed that sleep length less than seven hours per night predicted exhaustion on the burnout scale⁸. In addition, they found that medical students with less than five hours sleep per night had a significantly higher risk on all burnout subscales. The present study was, however, unable to replicate these findings. In it, the average hours of sleep per night were moderately high and above the critical limit of 7.5 hours observed in 12-year-old schoolchildren³⁴. Apparently, most of our students reported longer times in bed than this assumed critical limit. A further study could assess possible similar thresholds in the time in bed among the participants of the present study.

In contrast to previous research showing a high level of burnout and late bedtime to be related to late wake-up time in young adults⁵, the present study was unable to demonstrate that late bedtime and late wake-up time is linked to burnout. This discrepancy may in part be explained by the fact that in our sample there were no differences in time in bed between the chronotypes²⁴, as well as that the sample did include participants younger than the nationwide sample of Merikanto et al.⁵, which included young adults aged 18 to 29 years of age. Burnout and sleep duration may not be directly linked to each other, except under some working conditions³⁵. Further, sleep duration and chronotype are usually not directly linked to each other³⁶.

The present results clearly indicate that self-reported measures of daytime tiredness, daytime sleepiness, and sleep quality are linked to school burnout while time in bed per night during the school week and diurnal preferences are not. However, the study has some limitations. First, the measures were based on students' self-reports. Second, the cross-sectional design did not allow for studying causal effects. Despite its cross-sectional nature, however, this study offers insight into the meaning of the sleep-related factors behind school burnout. In general, our results contribute to the growing number of studies pointing to the relatively close relation between sleep and well-being^{6,9,10}.

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